MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) The following four forces act on a 4.00 kg object:
   \[ \vec{F}_1 = 300 \text{ N east} \]
   \[ \vec{F}_2 = 700 \text{ N north} \]
   \[ \vec{F}_3 = 500 \text{ N west} \]
   \[ \vec{F}_4 = 600 \text{ N south} \]
   What is the acceleration of the object?
   A) 300 N in a direction 26.6° north of west
   B) 2100 N in a direction 26.6° north of west
   C) 224 N in a direction 63.4° north of west
   D) 224 N in a direction 26.6° north of west
   E) 300 N in a direction 63.4° north of west

Answer: D

2) A dog is standing in the bed of a pickup truck. The bed is coated with ice, causing the force of friction between the dog and the truck to be zero. The truck is initially at rest, and then accelerates to the right, moving along a flat road. As seen from a stationary observer (watching the truck move to the right), the dog
   A) moves to the right, but not as quickly as the truck is moving to the right, causing it to slide towards the back of the truck.
   B) moves to the right at the same rate as the truck, so it doesn’t slide.
   C) moves to the left, as the truck moves to the right, causing the dog to slide towards the back of the truck.
   D) does not move left or right, but the back of the truck moves towards the dog.

Answer: D

3) A 60.0-kg person rides in an elevator while standing on a scale. The scale reads 400 N. The acceleration of the elevator is closest to
   A) 3.13 m/s² downward.
   B) zero.
   C) 6.67 m/s² downward.
   D) 9.80 m/s² downward.
   E) 6.67 m/s² upward.

Answer: A

4) An object is moving to the right, and experiencing a net force that is directed to the right. The magnitude of the force is decreasing with time. The speed of the object is
   A) decreasing.
   B) increasing.
   C) constant in time.

Answer: B
5) A 615 N student standing on a scale in an elevator notices that the scale reads 645 N. From this information, the student knows that the elevator must be moving
   A) downward.
   B) upward.
   C) You cannot tell if it is moving upward or downward.

Answer: C

6) You swing a bat and hit a heavy box with a force of 1500 N. The force the box exerts on the bat is
   A) less than 1500 N if the box moves.
   B) exactly 1500 N whether or not the box moves.
   C) exactly 1500 N only if the box does not move.
   D) greater than 1500 N if the box moves.
   E) greater than 1500 N if the bat bounces back.

Answer: B

7) Which one of the following free–body diagrams best represents the free–body diagram, with correct relative force magnitudes, of a person in an elevator that is traveling upward but is gradually slowing down at a rate of 9 m/s²? $\mathbf{F}_f$ is the force of the floor on the person and $\mathbf{F}_g$ is the force of gravity on the person.

A) 

B) 

C) 

D) 

E) 

Answer: B
8) A child on a sled starts from rest at the top of a 15° slope. If the trip to the bottom takes 15.2 s how long is the slope? Assume that frictional forces may be neglected.
A) 147 m  B) 1130 m  C) 586 m  D) 293 m
Answer: D

9) A block is on a frictionless horizontal table, on earth. This block accelerates at 1.9 m/s² when a 90 N horizontal force is applied to it. The block and table are then set up on the moon where the acceleration due to gravity is 1.62 m/s². What is the weight of the block on the moon?
A) 58 N  B) 67 N  C) 77 N  D) 48 N  E) 39 N
Answer: C

10) A fish weighing 16 N is weighed using two spring scales, each of negligible weight, as shown in the figure. What will be the readings of the scales?

A) The scales will have different readings, but the sum of the two readings will be 16 N.
B) Each scale will read 16 N.
C) The bottom scale will read 16 N, and the top scale will read zero.
D) The top scale will read 16 N, and the bottom scale will read zero.
E) Each scale will read 8 N.
Answer: B

11) A car is being towed at constant velocity on a horizontal road using a horizontal chain. The tension in the chain must be equal to the weight of the car in order to maintain constant velocity.
A) True  B) False
Answer: B

12) An 1100-kg car traveling at 27.0 m/s starts to slow down and comes to a complete stop in 578 m. What is the magnitude of the average braking force acting on the car?
A) 550 N  B) 410 N  C) 340 N  D) 690 N
Answer: D

13) You are standing in a moving bus, facing forward, and you suddenly fall forward as the bus comes to an immediate stop. The force acting on you that causes you to fall forward is
A) the normal force due to your contact with the floor of the bus.
B) the force due to static friction between you and the floor of the bus.
C) the force of gravity.
D) the force due to kinetic friction between you and the floor of the bus.
E) No forces were acting on you to cause you to fall.
Answer: E
14) A box slides down a frictionless plane inclined at an angle $\theta$ above the horizontal. The gravitational force on the box is directed
A) perpendicular to the plane.
B) parallel to the plane in the opposite direction as the movement of the box.
C) parallel to the plane in the same direction as the movement of the box.
D) at an angle $\theta$ below the inclined plane.
E) vertically.
Answer: E

15) A brick is resting on a rough incline as shown in the figure. The friction force acting on the brick, along the incline, is

A) greater than the weight of the brick.
B) zero.
C) less than the weight of the brick.
D) equal to the weight of the brick.
Answer: C

16) The figure shows two forces, each of magnitude 4.6 N, acting on an object. The angle between these forces is 40°, and they make equal angles above and below the horizontal. What third force will cause the object to be in equilibrium (acceleration equals zero)?

A) 7.0 N pointing to the right
B) 4.3 N pointing to the right
C) 8.6 N pointing to the right
D) 3.5 N pointing to the right
Answer: C

17) A 150-N box is being pulled horizontally in a wagon accelerating uniformly at 3.00 m/$s^2$. The box does not move relative to the wagon, the coefficient of static friction between the box and the wagon's surface is 0.600, and the coefficient of kinetic friction is 0.400. The friction force on this box is closest to
A) 90.0 N.
B) 60.0 N.
C) 450 N.
D) 45.9 N.
Answer: D
Answer Key
Testname: PHYS101_CHAP4PRACTICE

1) D
2) D
3) A
4) B
5) C
6) B
7) B
8) D
9) C
10) B
11) B
12) D
13) E
14) E
15) C
16) C
17) D